

Listing of Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1-20. (Canceled)

21. (Previously Presented) An apparatus for cleaning an irradiated nuclear fuel assembly, comprising:

an elongated housing having an opening at a first end configured to receive an irradiated nuclear fuel assembly, wherein said housing has a length at least as long as the irradiated nuclear fuel assembly; and

a plurality of ultrasonic transducers that each produce omnidirectional ultrasonic energy waves and positioned on said housing.

22. (Previously Presented) The apparatus of claim 21, wherein said housing is configured to receive an irradiated nuclear fuel assembly comprising an array of cylindrical rods.

23. (Withdrawn) The apparatus of claim 21, wherein said housing comprises a bottom end and a base plate attached to said bottom end.

24. (Previously Presented) The apparatus of claim 21, wherein said plurality of ultrasonic transducers is positioned along the entire length of said housing.

25. (Previously Presented) The apparatus of claim 21, wherein each of said ultrasonic transducers comprises an elongated rod having a first end and a second end; a first transducer at said first end; and a second transducer at said second end;

wherein each of said elongated rods is positioned substantially parallel to the length of said housing.

26. (Previously Presented) The apparatus of claim 25, wherein said plurality of ultrasonic transducers is positioned along the entire length of said housing.

27. (Withdrawn) The apparatus of claim 21, wherein said housing comprises an elongated, rectangular structure having four sides and wherein said plurality of ultrasonic transducers is positioned on each of said four sides.

28. (Withdrawn) The apparatus of claim 27 wherein each of said ultrasonic transducers comprises an elongated rod having a first end and a second end; a first transducer at said first end; and a second transducer at said second end; and wherein each of said elongated rods is positioned substantially parallel to a direction of elongation of said elongated, rectangular structure.

29. (Previously Presented) The apparatus of claim 21, wherein said housing is configured to receive an irradiated boiling water reactor nuclear fuel assembly.

30. (Previously Presented) The apparatus of claim 21, further comprising a reflector that comprises:

- a circular cylindrical inner reflecting surface positioned around a periphery of said housing; and

- a circular cylindrical outer reflecting surface positioned around a periphery of said circular cylindrical inner reflecting surface and forming a gap between said circular cylindrical inner reflecting surface and said circular cylindrical outer reflecting surface.

31. (Previously Presented) An apparatus for cleaning an irradiated nuclear fuel assembly, comprising:

- an elongated housing configured to receive an irradiated nuclear fuel assembly comprising a plurality of fuel rods and a spacing between each of said fuel rods; and

- a plurality of ultrasonic transducers positioned on said elongated housing that each produce omnidirectional ultrasonic energy waves having a node structure that is an approximate multiple of said spacing between each of said fuel rods.

32. (Previously Presented) The apparatus of claim 31, wherein said approximate multiple is one.

33. (Previously Presented) The apparatus of claim 31, further comprising a reflector that comprises:

a cylindrical inner reflecting surface positioned around a periphery of said elongated housing; and

a cylindrical outer reflecting surface positioned around a periphery of said cylindrical inner reflecting surface and forming an air gap between said cylindrical inner reflecting surface and said cylindrical outer reflecting surface.

34. (Previously Amended) An apparatus for cleaning an irradiated nuclear fuel assembly, comprising:

an elongated housing configured to receive an irradiated nuclear fuel assembly having at least four sides;

a plurality of ultrasonic transducers that each produce omnidirectional ultrasonic energy waves positioned on said elongated housing such that at least a first one of said ultrasonic transducers is adjacent to a first one of said four sides of said irradiated nuclear fuel assembly, at least a second one of said ultrasonic transducers is adjacent to a second one of said four sides of said irradiated nuclear fuel assembly, at least a third one of said ultrasonic transducers is adjacent to a third one of said four sides of said irradiated nuclear fuel assembly, and at least a fourth one of said ultrasonic transducers is adjacent to a fourth one of said four sides of said irradiated nuclear fuel assembly; and

a reflector comprising a circular cylindrical inner reflecting surface positioned around a periphery of said elongated housing; and a circular cylindrical outer reflecting surface positioned around a periphery of said circular cylindrical inner reflecting surface and forming an air gap between said circular cylindrical inner reflecting surface and said circular cylindrical outer reflecting surface.

35. (Previously Presented) The apparatus of claim 34, wherein said elongated housing extends in a predetermined direction and wherein each of said transducers comprises an elongated rod positioned substantially parallel to said predetermined direction.

36. (Previously Presented) The apparatus of claim 35, wherein said plurality of ultrasonic transducers comprises a plurality of ultrasonic transducers positioned adjacent to each of said four sides of said irradiated nuclear fuel assembly.

37. (Previously Presented) An apparatus for cleaning an irradiated nuclear fuel assembly, comprising:

a housing having an opening at a first end configured to receive an irradiated nuclear fuel assembly comprising a plurality of fuel rods and a spacing between each of said fuel rods, wherein said housing has a length at least as long as the irradiated nuclear fuel assembly; and

a plurality of ultrasonic transducers positioned on said housing, wherein each of said plurality of ultrasonic transducers produce omnidirectional ultrasonic energy waves having a node structure that is an approximate multiple of said spacing between each of said fuel rods.

38. (Previously Presented) The apparatus of claim 37, wherein said plurality of ultrasonic transducers is positioned axially along an entire length of said housing.

39. (Previously Presented) The apparatus of claim 37, wherein said approximate multiple is one.

40. (Previously Presented) The apparatus of claim 37, further comprising a reflector that comprises:

an circular cylindrical inner reflecting surface positioned around a periphery of said stationary housing; and

an circular cylindrical outer reflecting surface positioned around a periphery of said inner reflecting surface, in which an air gap is positioned between said inner reflecting surface and said outer reflecting surface.